

SEQUENCE LISTING

<110> KIM, TAE-YOON
BIO CLUE & SOLUTION CO., LT

<120> EC SOD and Cell transducing EC SOD and use thereof

<150> KR10-2003-0076629

<151> 2003-10-31

<160> 33

<170> KopatentIn 1.71

<210> 1

<211> 18

<212> DNA

<213> Artificial Sequence

<220>

<223> primer

<400> 1

atgttgcct tcttggtc

18

<210> 2

<211> 18

<212> DNA

<213> Artificial Sequence

<220>

<223> primer

<400> 2

ttaagtggtc ttgcactc

18

<210> 3

<211> 33

<212> DNA

<213> Artificial Sequence

<220>

<223> primer

<400> 3
agtctcgaga tgttggcctt cttgttctac ggc 33

<210> 4
<211> 28
<212> DNA
<213> Artificial Sequence

<220>
<223> primer

<400> 4
gacccctcgag tggctcttgca ctcgctct 28

<210> 5
<211> 27
<212> DNA
<213> Artificial Sequence

<220>
<223> primer

<400> 5
atctctagaa tgctggcgct acttgt 27

<210> 6
<211> 34
<212> DNA
<213> Artificial Sequence

<220>
<223> primer

<400> 6
atcgaatcct caggcggcct tgcactcgct ctct 34

<210> 7
<211> 30
<212> DNA
<213> Artificial Sequence

<220>

<223> primer

<400> 7

gacacctgag tggacgggag aggactcggc

30

<210> 8

<211> 31

<212> DNA

<213> Artificial Sequence

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<223> primer

<400> 8

gacacctgag tcaggcggcc ttgcactcgc t

31

<210> 9

<211> 30

<212> DNA

<213> Artificial Sequence

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<223> primer

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<210> 10

<211> 31

<212> DNA

<213> Artificial Sequence

<220>

<223> primer

<400> 10

aatgctcagag tcactctgag tgctcccgcg c

31

<210> 11

<211> 240

<212> PRT

<213> Homo sapiens

<220>

<221> PEPTIDE

<222> (1)..(240)

<223> Human EC SOD

<400> 11

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Met Leu Ala Leu Leu Cys Ser Cys Leu Leu Leu Ala Ala Gly Ala Ser
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Asp Ala Trp Thr Gly Glu Asp Ser Ala Glu Pro Asn Ser Asp Ser Ala
      20             25             30
Glu Trp Ile Arg Asp Met Tyr Ala Lys Val Thr Glu Ile Trp Gln Glu
      35             40             45
Val Met Gln Arg Arg Asp Asp Asp Gly Thr Leu His Ala Ala Cys Gln
      50             55             60
Val Gln Pro Ser Ala Thr Leu Asp Ala Ala Gln Pro Arg Val Thr Gly
65             70             75             80
Val Val Leu Phe Arg Gln Leu Ala Pro Arg Ala Lys Leu Asp Ala Phe
      85             90             95
Phe Ala Leu Glu Gly Phe Pro Thr Glu Pro Asn Ser Ser Ser Arg Ala
      100            105            110
Ile His Val His Gln Phe Gly Asp Leu Ser Gln Gly Cys Glu Ser Thr
      115            120            125
Gly Pro His Tyr Asn Pro Leu Ala Val Pro His Pro Gln His Pro Gly
      130            135            140
Asp Phe Gly Asn Phe Ala Val Arg Asp Gly Ser Leu Trp Arg Tyr Arg
145            150            155            160
Ala Gly Leu Ala Ala Ser Leu Ala Gly Pro His Ser Ile Val Gly Arg
      165            170            175
Ala Val Val Val His Ala Gly Glu Asp Asp Leu Gly Arg Gly Gly Asn
      180            185            190
Gln Ala Ser Val Glu Asn Gly Asn Ala Gly Arg Arg Leu Ala Cys Cys
      195            200            205
Val Val Gly Val Cys Gly Pro Gly Leu Trp Glu Arg Gln Ala Arg Glu
      210            215            220
His Ser Glu Arg Lys Lys Arg Arg Arg Glu Ser Glu Cys Lys Ala Ala
225            230            235            240

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<210> 12

<211> 231

<212> PRT

<213> Artificial Sequence

<220>

<223> TAT-EC SOD fusion protein

<400> 12
 Arg Lys Lys Arg Arg Gln Arg Arg Arg Trp Thr Gly Glu Asp Ser Ala
 1 5 10 15
 Glu Pro Asn Ser Asp Ser Ala Glu Trp Ile Arg Asp Met Tyr Ala Lys
 20 25 30
 Val Thr Glu Ile Trp Gln Glu Val Met Gln Arg Arg Asp Asp Gly
 35 40 45
 Thr Leu His Ala Ala Cys Gln Val Gln Pro Ser Ala Thr Leu Asp Ala
 50 55 60
 Ala Gln Pro Arg Val Thr Gly Val Val Leu Phe Arg Gln Leu Ala Pro
 65 70 75 80
 Arg Ala Lys Leu Asp Ala Phe Phe Ala Leu Glu Gly Phe Pro Thr Glu
 85 90 95
 Pro Asn Ser Ser Ser Arg Ala Ile His Val His Gln Phe Gly Asp Leu
 100 105 110
 Ser Gln Gly Cys Glu Ser Thr Gly Pro His Tyr Asn Pro Leu Ala Val
 115 120 125
 Pro His Pro Gln His Pro Gly Asp Phe Gly Asn Phe Ala Val Arg Asp
 130 135 140
 Gly Ser Leu Trp Arg Tyr Arg Ala Gly Leu Ala Ala Ser Leu Ala Gly
 145 150 155 160
 Pro His Ser Ile Val Gly Arg Ala Val Val Val His Ala Gly Glu Asp
 165 170 175
 Asp Leu Gly Arg Gly Gly Asn Gln Ala Ser Val Glu Asn Gly Asn Ala
 180 185 190
 Gly Arg Arg Leu Ala Cys Cys Val Val Gly Val Cys Gly Pro Gly Leu
 195 200 205
 Trp Glu Arg Gln Ala Arg Glu His Ser Glu Arg Lys Lys Arg Arg Arg
 210 215 220
 Glu Ser Glu Cys Lys Ala Ala
 225 230

<210> 13
 <211> 218
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> TAT-delta HD/EC SOD fusion protein

<400> 13
 Arg Lys Lys Arg Arg Gln Arg Arg Arg Trp Thr Gly Glu Asp Ser Ala
 1 5 10 15
 Glu Pro Asn Ser Asp Ser Ala Glu Trp Ile Arg Asp Met Tyr Ala Lys
 20 25 30
 Val Thr Glu Ile Trp Gln Glu Val Met Gln Arg Arg Asp Asp Gly

```

      35      40      45
Thr Leu His Ala Ala Cys Gln Val Gln Pro Ser Ala Thr Leu Asp Ala
  50      55      60
Ala Gln Pro Arg Val Thr Gly Val Val Leu Phe Arg Gln Leu Ala Pro
  65      70      75      80
Arg Ala Lys Leu Asp Ala Phe Phe Ala Leu Glu Gly Phe Pro Thr Glu
      85      90      95
Pro Asn Ser Ser Ser Arg Ala Ile His Val His Gln Phe Gly Asp Leu
      100      105      110
Ser Gln Gly Cys Glu Ser Thr Gly Pro His Tyr Asn Pro Leu Ala Val
      115      120      125
Pro His Pro Gln His Pro Gly Asp Phe Gly Asn Phe Ala Val Arg Asp
      130      135      140
Gly Ser Leu Trp Arg Tyr Arg Ala Gly Leu Ala Ala Ser Leu Ala Gly
  145      150      155      160
Pro His Ser Ile Val Gly Arg Ala Val Val Val His Ala Gly Glu Asp
      165      170      175
Asp Leu Gly Arg Gly Gly Asn Gln Ala Ser Val Glu Asn Gly Asn Ala
      180      185      190
Gly Arg Arg Leu Ala Cys Cys Val Val Gly Val Cys Gly Pro Gly Leu
      195      200      205
Trp Glu Arg Gln Ala Arg Glu His Ser Glu
      210      215

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<210> 14
 <211> 231
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> R9-EC SOD fusion protein

```

<400> 14
Arg Arg Arg Arg Arg Arg Arg Arg Trp Thr Gly Glu Asp Ser Ala
  1      5      10      15
Glu Pro Asn Ser Asp Ser Ala Glu Trp Ile Arg Asp Met Tyr Ala Lys
      20      25      30
Val Thr Glu Ile Trp Gln Glu Val Met Gln Arg Arg Asp Asp Asp Gly
      35      40      45
Thr Leu His Ala Ala Cys Gln Val Gln Pro Ser Ala Thr Leu Asp Ala
      50      55      60
Ala Gln Pro Arg Val Thr Gly Val Val Leu Phe Arg Gln Leu Ala Pro
  65      70      75      80
Arg Ala Lys Leu Asp Ala Phe Phe Ala Leu Glu Gly Phe Pro Thr Glu
      85      90      95
Pro Asn Ser Ser Ser Arg Ala Ile His Val His Gln Phe Gly Asp Leu
      100      105      110

```

Ser Gln Gly Cys Glu Ser Thr Gly Pro His Tyr Asn Pro Leu Ala Val
 115 120 125
 Pro His Pro Gln His Pro Gly Asp Phe Gly Asn Phe Ala Val Arg Asp
 130 135 140
 Gly Ser Leu Trp Arg Tyr Arg Ala Gly Leu Ala Ala Ser Leu Ala Gly
 145 150 155 160
 Pro His Ser Ile Val Gly Arg Ala Val Val Val His Ala Gly Glu Asp
 165 170 175
 Asp Leu Gly Arg Gly Gly Asn Gln Ala Ser Val Glu Asn Gly Asn Ala
 180 185 190
 Gly Arg Arg Leu Ala Cys Cys Val Val Gly Val Cys Gly Pro Gly Leu
 195 200 205
 Trp Glu Arg Gln Ala Arg Glu His Ser Glu Arg Lys Lys Arg Arg Arg
 210 215 220
 Glu Ser Glu Cys Lys Ala Ala
 225 230

<210> 15
 <211> 232
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> K10-EC SOD fusion protein

<400> 15
 Lys Lys Lys Lys Lys Lys Lys Lys Lys Lys Trp Thr Gly Glu Asp Ser
 1 5 10 15
 Ala Glu Pro Asn Ser Asp Ser Ala Glu Trp Ile Arg Asp Met Tyr Ala
 20 25 30
 Lys Val Thr Glu Ile Trp Gln Glu Val Met Gln Arg Arg Asp Asp Asp
 35 40 45
 Gly Thr Leu His Ala Ala Cys Gln Val Gln Pro Ser Ala Thr Leu Asp
 50 55 60
 Ala Ala Gln Pro Arg Val Thr Gly Val Val Leu Phe Arg Gln Leu Ala
 65 70 75 80
 Pro Arg Ala Lys Leu Asp Ala Phe Phe Ala Leu Glu Gly Phe Pro Thr
 85 90 95
 Glu Pro Asn Ser Ser Arg Ala Ile His Val His Gln Phe Gly Asp
 100 105 110
 Leu Ser Gln Gly Cys Glu Ser Thr Gly Pro His Tyr Asn Pro Leu Ala
 115 120 125
 Val Pro His Pro Gln His Pro Gly Asp Phe Gly Asn Phe Ala Val Arg
 130 135 140
 Asp Gly Ser Leu Trp Arg Tyr Arg Ala Gly Leu Ala Ala Ser Leu Ala
 145 150 155 160
 Gly Pro His Ser Ile Val Gly Arg Ala Val Val Val His Ala Gly Glu

[illegible]

<210>	16
<211>	696
<212>	DNA
<213>	Artificial Sequence

<220>
<223> nucleotide sequence encoding TAT-EC SOD fusion protein

[illegible]

<210>	17
<211>	657
<212>	DNA
<213>	Artificial Sequence

<220>
<223> nucleotide sequence encoding TAT-delta HD/EC SOD fusion protein

[illegible]


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cgcgccaagc tcgacgcctt ctctgccctg gagggcttcc cgaccgagcc gaacagctcc 300
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ccccactaca acccgctggc cgtgccgcac ccgcagcacc cgggcgactt cggcaacttc 420
gcggtccgcg acggcagcct ctggaggtag cgcgccggcc tggccgcctc gctcgcgggc 480
ccgcactcca tcgtgggccc ggccgtggtc gtccacgctg gcgaggacga cctgggccgc 540
ggcggaacc aggccagcgt ggagaacggg aacgcgggcc ggcggtggc ctgctgcgtg 600
gtgggcgtgt gcgggcccg gctctgggag cgccaggcgc gggagcactc agagtga 657

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<210> 18
 <211> 696
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> nucleotide sequence encoding R9-EC SOD fusion protein

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<400> 18
cgcgccgccc ggccggcgcc gcggcggtgg acggcgagg actcgccgga gccaactct 60
gactcgccgg agtggatccg agacatgtac gccaaagtca cggagatctg gcaggaggtc 120
atgcagccgg gggacgacga cggcacgctc cagccgcct gccaggtgca gccgtcggcc 180
acgtggagc cgcgcagcc ccgggtgacc ggctcgtcc tcttcggca gcttgcgcc 240
cgcgccaagc tcgacgcctt ctctgccctg gagggcttcc cgaccgagcc gaacagctcc 300
agccgcgcca tccacgtgca ccagttcggg gacctgagcc agggctgcga gtccaccggg 360
ccccactaca acccgctggc cgtgccgcac ccgcagcacc cgggcgactt cggcaacttc 420
gcggtccgcg acggcagcct ctggaggtag cgcgccggcc tggccgcctc gctcgcgggc 480
ccgcactcca tcgtgggccc ggccgtggtc gtccacgctg gcgaggacga cctgggccgc 540

ggcggaacc aggccagcgt ggagaacggg aacgcgggcc ggcggtggc ctgctgcgtg 600
gtgggcgtgt gcgggcccg gctctgggag cgccaggcgc gggagcactc agagcgcaag 660
aagcgccggc gcgagagcga gtgcaaggcc gcctga 696

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<210> 19
 <211> 699
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> nucleotide sequence encoding R9-EC SOD fusion protein

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<400> 19
aagaagaaga agaagaaga gaagaagaag tggacgggag aggactcggc ggagcccaac 60
tctgactcgg cggagtggat ccgagacatg tacccaagg tcacggagat ctggcaggag 120
gtcatgcagc ggccgggacga cgacggcacg ctccacgcc cctgccaggt gcagccgtcg 180
gccacgtgg acgccgcga gccccgggtg accggcgtcg tcctcttcg gcagcttgcg 240
ccccgcgcca agctcgacgc ctcttcgccc ctggagggtt tcccgaccga gccgaacagc 300

```

```

tccagccgcg ccatccacgt gcaccagttc ggggacctga gccagggctg cgagtcacc 360
gggccccact acaacccgct ggccgtgccg caccgcagc acccggcgga cttcggcaac 420
ttcgcggtcc ggcacggcag cctctggagg taccgcgcg gcctggccgc ctgcctcgcg 480
ggcccgcaact ccatcgtggg ccggggccgtg gtcgtccacg ctggcgagga cgacctgggc 540
cgcgccggca accaggccag cgtggagaaac gggaacgcgg gccggcggct ggcctgctgc 600
gtggtgggcg tgtgcgggcc cgggctctgg gagcgccagg cgcgggagca ctcagagcgc 660
aagaagcggc ggcgcgagag cgagtgaag gccgcctga 699

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<210> 20
 <211> 68
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> primer

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<400> 20
tatgaaagaa acctggtggg aaacctggtg gaccgaatgg tctcagccga aaaaaaacg 60
taaagtgc 68

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<210> 21
 <211> 70
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> primer

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<400> 21
tcgabcactt tacgtttttt tttcggctga gaccattcgg tccaccaggt ttcccaccag 60
gtttctttcc 70

```

<210> 22
 <211> 243
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> PEP1-EC SOD

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<400> 22
Lys Glu Thr Trp Trp Glu Thr Trp Trp Thr Glu Trp Ser Gln Pro Lys
122 126 131 136

```

Lys Lys Arg Lys Val Trp Thr Gly Glu Asp Ser Ala Glu Pro Asn Ser
 141 146 151
 Asp Ser Ala Glu Trp Ile Arg Asp Met Tyr Ala Lys Val Thr Glu Ile
 156 161 166
 Trp Gln Glu Val Met Gln Arg Arg Asp Asp Gly Thr Leu His Ala
 171 176 181
 Ala Cys Gln Val Gln Pro Ser Ala Thr Leu Asp Ala Ala Gln Pro Arg
 186 191 196 201
 Val Thr Gly Val Val Leu Phe Arg Gln Leu Ala Pro Arg Ala Lys Leu
 206 211 216
 Asp Ala Phe Phe Ala Leu Glu Gly Phe Pro Thr Glu Pro Asn Ser Ser
 221 226 231
 Ser Arg Ala Ile His Val His Gln Phe Gly Asp Leu Ser Gln Gly Cys
 236 241 246
 Glu Ser Thr Gly Pro His Tyr Asn Pro Leu Ala Val Pro His Pro Gln
 251 256 261
 His Pro Gly Asp Phe Gly Asn Phe Ala Val Arg Asp Gly Ser Leu Trp
 266 271 276 281
 Arg Tyr Arg Ala Gly Leu Ala Ala Ser Leu Ala Gly Pro His Ser Ile
 286 291 296
 Val Gly Arg Ala Val Val Val His Ala Gly Glu Asp Asp Leu Gly Arg
 301 306 311
 Gly Gly Asn Gln Ala Ser Val Glu Asn Gly Asn Ala Gly Arg Arg Leu
 316 321 326
 Ala Cys Cys Val Val Gly Val Cys Gly Pro Gly Leu Trp Glu Arg Gln
 331 336 341
 Ala Arg Glu His Ser Glu Arg Lys Lys Arg Arg Arg Glu Ser Glu Cys
 346 351 356 361
 Lys Ala Ala

<210> 23
 <211> 230
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> PEP1-deltaHD/EC SOD

<400> 23
 Lys Glu Thr Trp Trp Glu Thr Trp Trp Thr Glu Trp Ser Gln Pro Lys
 123 127 132 137
 Lys Lys Arg Lys Val Trp Thr Gly Glu Asp Ser Ala Glu Pro Asn Ser
 142 147 152
 Asp Ser Ala Glu Trp Ile Arg Asp Met Tyr Ala Lys Val Thr Glu Ile
 157 162 167
 Trp Gln Glu Val Met Gln Arg Arg Asp Asp Asp Gly Thr Leu His Ala

172 177 182
 Ala Cys Gln Val Gln Pro Ser Ala Thr Leu Asp Ala Ala Gln Pro Arg
 187 192 197 202
 Val Thr Gly Val Val Leu Phe Arg Gln Leu Ala Pro Arg Ala Lys Leu
 207 212 217
 Asp Ala Phe Phe Ala Leu Glu Gly Phe Pro Thr Glu Pro Asn Ser Ser
 222 227 232
 Ser Arg Ala Ile His Val His Gln Phe Gly Asp Leu Ser Gln Gly Cys
 237 242 247

 Glu Ser Thr Gly Pro His Tyr Asn Pro Leu Ala Val Pro His Pro Gln
 252 257 262
 His Pro Gly Asp Phe Gly Asn Phe Ala Val Arg Asp Gly Ser Leu Trp
 267 272 277 282
 Arg Tyr Arg Ala Gly Leu Ala Ala Ser Leu Ala Gly Pro His Ser Ile
 287 292 297
 Val Gly Arg Ala Val Val Val His Ala Gly Glu Asp Asp Leu Gly Arg
 302 307 312
 Gly Gly Asn Gln Ala Ser Val Glu Asn Gly Asn Ala Gly Arg Arg Leu
 317 322 327
 Ala Cys Cys Val Val Gly Val Cys Gly Pro Gly Leu Trp Glu Arg Gln
 332 337 342
 Ala Arg Glu His Ser Glu
 347 352

<210> 24
 <211> 737
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> nucleotide sequence encoding PEP1-EC SOD fusion protein

<400> 24
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 taaactgctg gacgggagag gactcggcgg agcccaactc tgactcggcg gactggatcc 120
 gagacatgta cgccaaggct acggagatct ggcaggaggt catgcagcgg cgggacgacg 180
 acggcacgct ccacgccgcc tgccaggtgc agccgtcggc cacgctggac gccgcgcagc 240
 cccgggtgac cggcgctcgt cttttccggc agcttgcgcc ccgcgccaag ctgcagcct 300
 tcttcgccct ggagggttcc ccgaccgagc cgaacagctc cagccgcgcc atccacgtgc 360
 accagttcgg ggacctgagc cagggtcgcg agtccaccgg gccccactac aaccgctgg 420
 ccgtgccgca ccgcgagcac ccgggagact tcggcaactt cgcggtccgc gacggcagcc 480
 tctggaggta ccgcgccggc ctggccgcct cgtcgcggg cccgcactcc atcgtgggcc 540
 gggccgtggt cgtccacgct ggccaggagc acctgggccc cggcggcaac caggccagcg 600
 tggagaacgg gaacgcgggc cggcggctgg cctgctgcgt ggtgggcgtg tgcgggccc 660
 ggctctggga gcgccaggcg cgggagcact cagagcgcaa gaagcggcgg cgcgagagcg 720
 agtgcaaggc cgcctga 737

<210> 25
 <211> 695
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> nucleotide sequence encoding PEP1-deltaHD/EC SOD fusion protein

<400> 25
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 taaactgctg gacgggagag gactcggcgg agcccaactc tgactcggcg gactggatcc 120
 gagacatgta cgccaagggtc acggagatct ggacaggagt catgcagcgg cgggacgacg 180
 acggcacgct ccacgccgcc tgccagggtc agccgtcggc cacgtggac gccgcgcagc 240
 cccgggtgac cggcgtcgtc ctcttcggc agcttgcgcc ccgcgccaag ctgcacgcct 300
 tcttcgccct ggagggttc ccgaccgagc cgaacagctc cagccgcgcc atccacgtgc 360
 accagttcgg ggacctgagc cagggtcgcg agtccaccgg gccccactac aaccgcctgg 420
 ccgtgccgca ccgcgagcac ccgggcgact tcggcaactt cgcggtccgc gacggcagcc 480
 tctggaggta ccgcgccggc ctggccgcct cgtcgcggg cccgcactcc atcgtgggcc 540
 gggccgtggt cgtccacgtc ggccaggagc acctgggccg cggcggcaac caggccagcg 600
 tggagaacgg gaacgcgggc cggcggctgg cctgtctgct ggtgggcgtg tgcgggcccg 660
 ggctctggga gcgccaggcg cgggagcact cagag 695

<210> 26
 <211> 19
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> primer

<400> 26
 ttgtctctaa tagagggtc 19

<210> 27
 <211> 19
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> primer

<400> 27

tcaagcctgt ctatcttct

19

<210> 28

<211> 21

<212> DNA

<213> Artificial Sequence

<220>

<223> primer

<400> 28

atctacagct cctttggtct t

21

<210> 29

<211> 20

<212> DNA

<213> Artificial Sequence

<220>

<223> primer

<400> 29

atctacagct cctttggctt

20

<210> 30

<211> 20

<212> DNA

<213> Artificial Sequence

<220>

<223> primer

<400> 30

aaccctcaga gccacccta

20

<210> 31

<211> 20

<212> DNA

<213> Artificial Sequence

<220>

<223> primer

<400> 31
gtgcatacaa agcaaactgc

20

<210> 32
<211> 20
<212> DNA
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<220>
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<400> 32
catcttccag gagcgagacc

20

<210> 33
<211> 20
<212> DNA
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<220>
<223> primer

<400> 33
tccaccaccc tgttgctgta

20